Application No.: 10/620,675 Attorney Docket No.: 200210251-1

Certificate of Transmission

I hereby certify that this correspondence is being facsimile transmitted to the Commissioner for Patents via the USPTO central facsimile number, (571) 273-8300.

on April 12, 2007
Date

Signature

Rebecca R. Schow
Typed or printed name of person signing Certificate

Transmitted, herewith, are the following documents:

1. Transmittal of Appeal Brief with Duplicate Copy (2 pages)
2. Certificate of Transmission (1 page)
3. Appeal Brief (21 pages)

RECEIVED
CENTRAL FAX CENTER

APR 1 2 2007

HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, Colorado 80527-2400

PATENT APPLICATION

ATTORNEY DOCKET NO. 200210251-1

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): David Punsalan et al.

Confirmation No.: 9644

Application No.: 10/620,675

Examiner: YUAN, Dah Wei D

Filing Date: July 15, 2003

Group Art Unit: 1745

Title: A System and a Method for Manufacturing an Electrolyte Using Electrodeposition

Mail Stop Appeal Brief-Patents
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on February 12, 2007.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) $500.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

☐ (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d)) for the total number of months checked below:

☐ 1st Month $120	☐ 2nd Month $450	☐ 3rd Month $1020	☐ 4th Month $1590

☐ The extension fee has already been filed in this application.

☒ (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account 08-2025 the sum of $ 500. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed.

☐ I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, Alexandria, VA 22313-1450
Date of Deposit:

OR

☒ I hereby certify that this paper is being transmitted to the Patent and Trademark Office facsimile number (571)273-8300.
Date of facsimile: April 12, 2007
Typed Name: Rebecca R. Schow
Signature:

Respectfully submitted,
David Punsalan et al.
By

Steven L. Nichols
Attorney/Agent for Applicant(s)
Reg No. : 40,326
Date : April 12, 2007
Telephone : 801-572-8066

Rev 10/05 (ApiBrief)

200210251-1 10/620,675

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the Patent Application of

David Punsalan et al.

Application No. 10/620,675

Filed: July 15, 2003

For: A System and a Method for Manufacturing an Electrolyte Using Electrodeposition

Group Art Unit: 1745

Examiner: YUAN, Dah Wei D.

APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is an Appeal Brief under Rule 41.37 appealing the decision of the Primary Examiner dated December 21, 2006 (the "final Office Action"). Each of the topics required by Rule 41.37 is presented herewith and is labeled appropriately.

I. Real Party in Interest

The real party in interest is Hewlett-Packard Development Company, LP, a limited partnership established under the laws of the State of Texas and having a principal place of business at 20555 S.H. 249 Houston, TX 77070, U.S.A. (hereinafter "HPDC"). HPDC is a Texas limited partnership and is a wholly-owned affiliate of Hewlett-Packard Company, a Delaware Corporation, headquartered in Palo Alto, CA. The general or managing partner of HPDC is HPQ Holdings, LLC.

II. Related Appeals and Interferences

There are no appeals or interferences related to the present application of which the Appellants are aware.

III. Status of Claims

Claims 19-54 were withdrawn under the previous imposition of a Restriction Requirement and cancelled without prejudice or disclaimer.

In the final Office Action, the Office improperly restricted claims 66 and 67 without a supporting explanation as to why they constitute a different species that the other claims. Consequently, while Appellant traverses this improper restriction, claims 66 and 67 are considered withdrawn for purposes of this appeal and are, therefore, not listed in the Appendix.

Claims 1-18 and 55-65 are currently pending and stand finally rejected. Accordingly, Appellant appeals from the final rejection of claims 1-18 and 55-65, which claims are presented in the Appendix.

IV. Status of Amendments

No amendments have been filed subsequent to the final Office Action of December 21, 2006, from which Appellant takes this appeal.

V. Summary of Claimed Subject Matter

During the past several years, the popularity and viability of fuel cells for producing both large and small amounts of electricity has increased significantly. (*Appellant's specification, paragraph 0001).* Fuel cells typically function by supplying hydrogen to an anode. The hydrogen provides protons to an electrolyte and releases electrons that pass through an external circuit to power a load before reaching a cathode located on the opposite side of the electrolyte from the anode. After being stripped of the electrons, the protons solvate with water molecules and diffuse through the membrane to the cathode where they react with oxygen that has picked up electrons thereby forming water. (*Appellant's specification, paragraph 0003).*

Appellant's specification describes and claims methods of forming an electrolyte for use in a fuel cell. The electrolyte is formed of a polymer material using electro-deposition. (*Appellant's specification, paragraph 0018).* Appellant has discovered that such an electrolyte reduces the likelihood of swelling in a fuel cell while increasing structural support." (*Appellant's specification, paragraph 0018).*

The term "electrodeposition" is meant to be understood both here and in the appended claims to mean the precipitation of a material at an electrode as the result of a passage of an electric current through or an application of an electrical field on a solution or suspension of material. Similarly, the term "electrolyte" is meant to be understood broadly as referring to a substance, either solid or liquid, that will provide ionic conductivity when dissolved in water

or when in contact with it. One solid electrolyte, used originally in fuel cells, is a polymer of perflourinated sulfonic acid. (*Appellant's specification, paragraph 0019).*

Turning to specific claims:

Claim 1 recites:

A method of manufacturing an electrolyte comprising:

coupling (300) a substrate (250) to a charged electrode (240) (*Appellant's specification, paragraph 0029).*; and

electrodepositing (330) a polymeric electrolyte (400) on said substrate (250) (*Appellant's specification, paragraph 0029).*

Claim 57 recites A method of manufacturing an electrolyte comprising electrodepositing (330) a polymeric electrolyte (400) on a substrate (250) (*Appellant's specification, paragraph 0029).*

VI. Grounds of Rejection to be Reviewed on Appeal

In the final Office Action of December 21, 2006, the following grounds of rejection were raised.

(1) Claims 1, 2, 4-18, 55-59 and 61-65 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of U.S. Patent App. Pub. No. 2002/0172871 to Schucker ("Schucker"), U.S. Patent App. Pub. No. 2001/0014420 to Takeuchi et al. ("Takeuchi") and U.S. Patent No. 5,002,647 to Tanabe et al. ("Tanabe").

(2) Claims 2-7 and 60-64 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of Schucker, Takeuchi, Tanabe and U.S. Patent No. 6,258,861 to Steck et al. ("Steck").

Appellant notes that, for some unexplained reason, the final Office Action listed the rejection of claims 56 and 59 separately. However, the basis for that rejection is the same prior art combination as proposed in the rejection of claims 1 and 57. Therefore, for the sake of brevity and organization, all the claims rejected based on Schucker, Takeuchi and Tanabe are listed together above.

Accordingly, Appellant hereby requests review of both these grounds of rejection in the current appeal.

VII. Argument

(1) Claims 1, 2, 4-18, 55-59 and 61-65 are patentable over Stucker Takeuchi and Tanabe:

Claims 1 and 57:

Claim 1 recites:

> A method of manufacturing an electrolyte comprising:
> coupling a substrate to a charged electrode; and
> *electrodepositing* a polymeric electrolyte on said substrate.

(Emphasis added).

In contrast, the combination of prior art cited against claim 1 fails to teach or suggest the method of claim 1. Specifically, the cited combination of prior art fails to teach or suggest either "coupling a substrate to a charged electrode" or "electrodepositing a polymeric electrolyte on that substrate.

As cited in the Office Action (Action of 12/21/06, p. 2), Schucker teaches a three step process in which a precursor of a porous substrate is deposited. (Schucker, paragraph 0032).

Then, "via electrophoretic deposition," a precursor to an ionically conductive layer is deposited. (Schucker, paragraph 0033). The resulting green structure is then dried and sintered. (Schucker, paragraph 0034). Consequently, Schucker fails to teach or suggest the claimed subject matter.

In the first place, Schucker fails to teach or suggest "coupling a substrate to a charged electrode" as claimed. The final Office Action fails to indicate how or where Schucker teaches that a substrate is coupled to a charged electrode. To the contrary, Schucker apparently teaches an entirely different process that includes depositing a precursor material, without reference to a charged electrode. The deposited precursor material does not become a substrate until dried and sintered at the end of the process. Consequently, Schucker fails to teach or suggest "coupling a substrate to a charged electrode" as claimed. None of the other cited references appear to remedy this deficiency.

Additionally, Schucker fails to teach or suggest the claimed "electrodepositing of a polymeric electrolyte on said substrate." The final Office Action agrees. According to the Action, Schucker "teaches a method of manufacturing a composite electrolyte .... However, Schucker [does] not teach specifically [that] the ionic conductive composition is a polymeric electrolyte." (Action of 12/21/06, p. 2).

Consequently, the Office Action cites to the teachings of Takeuchi in combination with Schucker. According to the Office Action, "Takeuchi et al. teach [that] an ionic conductive material for use as a membrane in a fuel cell can be an inorganic compound such as NASICON or a polymeric compound." (Action of 12/21/06, p. 2).

Assuming the Office Action is correct in this characterization of Takeuchi, Takeuchi still does not teach or suggest that a polymeric electrolyte is formed by "*electrodepositing* a polymeric electrolyte on said substrate." (Emphasis added). Takeuchi does not appear to

teach or suggest electrodepositing a polymeric electrolyte on a substrate. None of the cited prior art references teach or suggest electrodepositing a *polymer* material on a substrate to produce a polymeric electrolyte as claimed.

The final Office Action also adds Tanabe to the mix of prior art on which the rejection of claim 1 is based. However, it is not entirely clearly why. Tanabe clearly does not teach or suggest electrodepositing a polymer material to produce a polymeric electrolyte, nor does the final Office Action allege that Tanabe provides such a teaching. Consequently, no prior art reference of record appears to teach or suggest the claimed method including "*electrodepositing* a polymeric electrolyte on said substrate." (Emphasis added).

Thus, the cited prior art fails to teach either (1) coupling a substrate to a charged electrode or (2) electrodepositing a polymeric electrolyte on said substrate. "To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)." M.P.E.P. § 2143.03. Accord. M.P.E.P. § 706.02(j). For at least these reasons, the rejection based on the combination of Schucker, Takeuchi and Tanabe should not be sustained.

Independent claim 57 recites: "A method of manufacturing an electrolyte comprising electrodepositing a polymeric electrolyte on a substrate." As amply demonstrated above, the cited prior art fails to teach or suggest a method that includes electrodepositing a polymeric electrolyte on a substrate. Therefore, the rejection of claim 57 should also not be sustained.

Claim 2:

Additionally, the various dependent claims of the application recite subject matter that is further patentable over the prior art of record. Specific, non-exclusive examples follow.

Claim 2 recites "wherein said substrate comprises a conductive porous substrate." In this regard, the Office Action argues that Schucker teaches a porous substrate, "such as yttria-stabilized zirconia, [that] is an ionic conductive material." (Action of 12/21/06, p. 3).

However, claim 2 does not recite an *ionic* conductive material. Rather, claim 2 recites that the substrate is conductive, meaning electrically conductive. Appellant wishes to note that the meaning of words used in the claims is determined by the meaning given to those words in the specification. *Markman v. Westview Instruments*, 116 S. Ct. 1384 (1996); *McGill, Inc. v. John Zink Co.*, 736 F.2d 666, 674 (Fed. Cir. 1984); *ZMI Corp. v. Cardiac Resuscitator Corp.* 884 F.2d 1576, 1580, 6 U.S.P.Q.2d 1557, 1560-61 (Fed. Cir. 1988) ("words must be used in the same way in both the claims and the specification.").

In this regard, Appellant's specification makes clear that, in the context of claim 2, the term "conductive" refers to electrically conductive. (*See*, Appellant's specification, paragraphs 0030 and 0031). When properly construed, this subject matter of claim 2 is not taught or suggested by the prior art. For at least this additional reason, the rejection of claim 2 should not be sustained.

Claim 4:

Claim 4 recites "wherein said porous substrate is electrically coupled to said charged electrode." In this regard, the final Office Action alleges that Schucker teaches that the substrate is electrically coupled to a charged electrode at paragraphs 0031-0033. (Action of 12/21/06, p, 5). This is incorrect. The cited paragraphs of Schucker are discussed above and do not mention a charged electrode or coupling a substrate to a charged electrode. To the contrary, the cited paragraphs of Schucker teach that a precursor of a substrate is deposited and then later dried and sintered.

Thus, the final Office Action fails to establish that the prior art teaches or suggests all the features of claim 4. For at least this additional reason, the rejection of claim 4 should not be sustained.

Claims 5, 10 and 16:

Claim 5 recites:

> wherein said electrodepositing a polymeric electrolyte further comprises:
> disposing said porous substrate and said charged electrode in a polymeric electrolyte solution containing charged polymeric electrolyte particles; and
> generating an electric field in said polymeric electrolyte solution;
> wherein said electric field accelerates charged polymeric electrolyte particles to said porous substrate.

Claims 10 and 16 recite similar subject matter.

In contrast, the cited prior art references utterly fail to teach or suggest this subject matter. In particular, there is no reference among the cited prior art documents that teaches, suggests or even mentions the claimed "solution containing charged polymeric electrolyte particles." The final Office Action fails to indicate a teaching of such a solution anywhere in the cited prior art.

Additionally, none of the cited references teach or suggest disposing a porous substrate and a charged electrode, to which the substrate is coupled, in a polymeric electrolyte solution containing charged polymeric electrolyte particles. The final Office Action fails to indicate how or where the cited prior art teaches this subject matter.

None of the cited references teach or suggest generating an electric field in a *polymeric* electrolyte solution. Again, the final Office Action fails to indicate how or where the cited prior art teaches this subject matter.

For at least these additional reasons, the rejection of claims 5, 10 and 16 should not be sustained.

Claim 8:

Claim 8 recites "further comprising removing deposited perfluorosulfonate ionomer particles from an outer surface of said porous substrate." The final Office Action concedes that the cited prior art does not teach or suggest this subject matter, but nevertheless argues that such a method step would have been obvious. (Action of 12/21/03, p. 3). This is clearly improper.

"To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)." M.P.E.P. § 2143.03. (emphasis added). *Accord.* M.P.E.P. § 706.02(j). Moreover, it is the responsibility of the Examiner to demonstrate that all the features of the claim are taught in the prior art.

Prior to the final Office Action, Appellant expressly requested that the Examiner cite prior art demonstrating that the claimed removal of deposited perfluorosulfonate ionomer particles was known in the prior art. The final Office Action failed to do so contrary to the requirements of M.P.E.P § 2144.03. Consequently, it has *not* been demonstrated on the present record that the subject matter of claim 8 is obvious in view of the cited prior art.

For at least these additional reasons, the rejection of claim 8 is insufficient and should not be sustained.

(2) Claims 2-7 and 60-64 are patentable over Schucker, Takeuchi, Tanabe and Steck

The rejection of claim 2 has already been addressed above. The rejection of claim 2 under this section is traversed for the same reasons.

Claim 3:

Claim 3 recites "wherein said conductive porous substrate comprises a porous stainless steel substrate." Appellant notes that, as demonstrated above, the principal reference Schucker, teaches depositing a precursor to a porous substrate which is later dried and sintered. (Schucker, paragraph 0032-34). Therefore, Schucker's teachings clearly do not include and are incompatible with the claimed stainless steel substrate of claim 3.

In this regard, the Office Action refers to Tanabe which allegedly teaches that "the cathode can be selected from the group consisting of stainless steel [et al.]." (Action of 12/21/06, p. 4). However, the cathode is the electrode, not the substrate coupled to the electrode, as recited in claims 1 and 3. Therefore, a teaching that the electrode can be stainless steel clearly does not also convey that a porous substrate coupled to the electrode is or should be stainless steel. The final Office Action is clearly incorrect in trying to read this subject matter in to Tanabe.

Thus, the final Office Action fails to establish that the prior art teaches or suggests all the features of claim 3. For at least this additional reason, the rejection of claim 3 should not be sustained.

Claim 60:

Claim 60 recites "wherein said substrate comprises an electrically-conductive, porous substrate." The final Office Action fails to indicate how or where the cited prior art is

thought to teach this subject matter. As noted above, the Office Action seems to have some confusion between the electrode (cathode) which may be stainless steel as compared to the substrate coupled to the electrode on which a polymeric electrolyte is electrodeposited. In any event, the Office Action fails to make a *prima facie* case of unpatentability as to claim 60 by failing to demonstrate how or where the subject matter of claim 60 is taught or suggested by the cited prior art. For at least these additional reasons, the rejection of claim 60 should not be sustained.

In view of the foregoing, it is submitted that the final rejection of the pending claims is improper and should not be sustained. Therefore, a reversal of the Rejection of December 21, 2006 is respectfully requested.

Respectfully submitted,

DATE: April 12, 2007

Steven L. Nichols
Registration No. 40,326

Steven L. Nichols, Esq.
Managing Partner, Utah Office
Rader Fishman & Grauer PLLC
River Park Corporate Center One
10653 S. River Front Parkway, Suite 150
South Jordan, Utah 84095
(801) 572-8066
(801) 572-7666 (fax)

CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being transmitted to the Patent and Trademark Office facsimile number 571-273-8300 on April 12, 2007. Number of Pages: 24

Rebecca R. Schow

VIII. CLAIMS APPENDIX

1. (original) A method of manufacturing an electrolyte comprising:

coupling a substrate to a charged electrode; and

electrodepositing a polymeric electrolyte on said substrate.

2. (original) The method of claim 1, wherein said substrate comprises a conductive porous substrate.

3. (original) The method of claim 2, wherein said conductive porous substrate comprises a porous stainless steel substrate.

4. (original) The method of claim 2, wherein said porous substrate is electrically coupled to said charged electrode.

5. (original) The method of claim 2, wherein said electrodepositing a polymeric electrolyte further comprises:

disposing said porous substrate and said charged electrode in a polymeric electrolyte solution containing charged polymeric electrolyte particles; and

generating an electric field in said polymeric electrolyte solution;

wherein said generated electric field accelerates charged polymeric electrolyte particles to said porous substrate.

6. (original) The method of claim 5, wherein said charged polymeric electrolyte particles further comprise perfluorosulfonate ionomer particles.

7. (original) The method of claim 6, wherein said perfluorosulfonate ionomer particles are deposited on said porous substrate by electrophoretic deposition.

8. (original) The method of claim 7, further comprising removing deposited perfluorosulfonate ionomer particles from an outer surface of said porous substrate.

9. (original) The method of claim 8, wherein said removal of deposited perfluorosulfonate ionomer particles comprises machining said particles with a blade.

10. (previously presented) The method of claim 1, wherein said electrodepositing a polymeric electrolyte further comprises:

disposing said substrate and said charged electrode in a polymeric electrolyte solution containing charged polymeric electrolyte ions; and

generating an electric field in said polymeric electrolyte solution;

wherein said electric field accelerates charged polymeric electrolyte ions to said substrate.

11. (original) The method of claim 10, wherein said charged polymeric electrolyte ions further comprise perfluorosulfonate ionomer ions.

12. (original) The method of claim 11, wherein said perfluorosulfonate ionomer ions are deposited on said porous substrate by electrolytic deposition.

13. (original) The method of claim 12, wherein said perfluorosulfonate ionomer ions are deposited on an outer surface of said porous substrate.

14. (original) The method of claim 1, wherein said substrate comprises a non-conductive porous substrate.

15. (original) The method of claim 14, wherein said porous substrate is mechanically coupled to said charged electrode.

16. (previously presented) The method of claim 14, wherein said electrodepositing a polymeric electrolyte further comprises:

disposing said porous substrate and said charged electrode in a polymeric electrolyte solution containing charged polymeric electrolyte particles; and

generating an electric field in said polymeric electrolyte solution;

wherein said electric field accelerates charged polymeric electrolyte particles to said porous substrate.

17. (original) The method of claim 16, wherein said charged polymeric electrolyte particles further comprise perfluorosulfonate ionomer particles.

18. (original) The method of claim 17, wherein said perfluorosulfonate ionomer particles are deposited on said porous substrate by electrophoretic deposition.

19-54. (cancelled)

55. (previously presented) A polymeric electrolyte manufactured by the method of claim 1.

56. (previously presented) A fuel cell comprising:

an anode;

a cathode; and

a polymeric electrolyte disposed between said anode and cathode, said polymeric electrolyte manufactured by the method of claim 1.

57. (previously presented) A method of manufacturing an electrolyte comprising electrodepositing a polymeric electrolyte on a substrate.

58. (previously presented) A polymeric electrolyte manufactured by the method of claim 57.

59. (previously presented) A fuel cell comprising:

an anode;

a cathode; and

a polymeric electrolyte disposed between said anode and cathode, said polymeric electrolyte manufactured by the method of claim 57.

60. (previously presented) The method of claim 57, wherein said substrate comprises an electrically-conductive, porous substrate.

61. (previously presented) The method of claim 57, wherein said electrodepositing a polymeric electrolyte comprises:

disposing said substrate and a charged electrode in a polymeric electrolyte solution containing charged polymeric electrolyte particles; and

generating an electric field in said polymeric electrolyte solution with said charged electrode;

wherein said electric field deposits polymeric electrolyte particles to said substrate to form said electrolyte.

62. (previously presented) The method of claim 61, wherein said charged polymeric electrolyte particles further comprise perfluorosulfonate ionomer particles.

63. (previously presented) The method of claim 62, wherein said perfluorosulfonate ionomer particles are deposited on said substrate by electrophoretic deposition.

64. (previously presented) The method of claim 63, further comprising removing deposited perfluorosulfonate ionomer particles from an outer surface of said substrate.

65. (previously presented) The method of claim 61, further comprising removing deposited polymeric particles from an outer surface of said substrate.

66-67. (withdrawn)

IX. Evidence Appendix

None

X. Related Proceedings Appendix

None

XI. Certificate of Service

None